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EXAMINER	
DONADO, FRANK E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,747	HOSOKAWA ET AL.	
	Examiner	Art Unit	
	FRANK DONADO	4173	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/06/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 4, 8, 15, 17, 18, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki, et al **(US PG Publication 2004/0190657),** in view of Examiner's Official Notice. From now on, Seki, et al, will be referred to as Seki.

Regarding claim 1, Seki teaches a wireless communication apparatus **(Paragraph 2)** comprising: a transmission path fluctuation period detection unit for detecting a transmission path fluctuation period **(The phase difference calculator 12 of Fig. 13)** in which transmission path fluctuation caused by a discharge lamp is greater than other in other periods **(Fading is caused by changing frequencies due to signals transmitted from outside the transmission path, for example signals transmitted from a vehicle due to the Doppler effect, Paragraph 11, Paragraph 58, lines 1-4 and Paragraph 60, lines 1-4)**; and a transmission control unit that packetizes a bit stream and selectively operates in a normal transmission mode that does not restrict packet transmissions or in a restricted transmission mode that restricts packet transmissions; wherein the transmission control unit selects the restricted transmission mode when the packet transmission period at least overlaps the transmission path fluctuation period, and selects the normal transmission mode when the packet transmission period does not overlap the transmission path fluctuation period **(Frames are processed through an estimation algorithm involving a conversion of signal information to digital data bits, a calculation is performed to correct the phase variation due to fading, and the timing of the transmission is changed to compensate for the fading, if needed, and not compensate for the fading if not needed, Abstract, lines 6-15, Paragraph 60, lines 1-4, Paragraph 83, lines 5-7, Paragraph 86, lines 8-11 and Paragraph 93, lines 3-14),** except for a discharge lamp is not named as that which causes the transmission path fluctuation.

Examiner takes Official Notice that it would have been an obvious matter of design choice to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to name a discharge lamp as a specific cause of transmission fluctuation instead of the Doppler Effect as the cause of fading for the benefit of using the light emission to identify the transmission path fluctuation period.

Regarding claim 3, Seki teaches the wireless communication apparatus as described in claim 1. Seki further teaches the transmission path fluctuation period detection unit **(The phase difference calculator 12 of Fig. 13)** comprises a photoelectric conversion unit **(A complex impulse response measurement unit, 11 of Fig. 13, that generates a complex impulse response transmitted to the phase difference calculator)** which generates an electric signal from ambient light around the wireless communication apparatus, and the transmission path fluctuation period is detected based on change in output from the photoelectric conversion unit **(The phase difference calculator determines the path with the least fading from the complex impulse response signal, Paragraph 86, lines 8-11, Paragraph 87, lines 9-13 and Paragraph 91, lines 5-8),** except for the conversion unit used to generate the signal is the complex impulse response extractor instead of a photoelectric conversion unit. Examiner takes Official Notice that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use a photoelectric conversion unit as a matter of design choice for the benefit of outputting the signal to be used to identify fluctuations in transmission.

Regarding claim 4, Seki teaches the wireless communication apparatus as described in claim 1, wherein the transmission path fluctuation period detection unit comprises a means of detecting a rising period and falling period of light output by the discharge lamp, and at least the rising period and falling period are detected as the transmission path fluctuation period **(Paragraph 54, lines 3-8 and Figure 6).**

Regarding claim 8, Seki teaches the wireless communication apparatus as described in claim 1, wherein the restricted transmission mode is a mode in which data packets are transmitted at a low rate **(Transmission packets are transmitted at a lower rate due to fading, Paragraph 47, lines 4-7)**.

Regarding claim 15, Seki teaches a wireless communication method comprising steps of: detecting a transmission path fluctuation period in which transmission path fluctuation caused by a discharge lamp is greater than other in other periods **(Fading is caused by changing frequencies due to signals transmitted from outside the transmission path, for example signals transmitted from a vehicle due to the Doppler effect, Paragraph 11, Paragraph 58, lines 1-4 and Paragraph 60, lines 1-4)**; and packetizing a bit stream and selecting a normal transmission mode that does not restrict packet transmissions or a restricted transmission mode that restricts packet transmissions; wherein the restricted transmission mode is selected when the packet transmission period at least overlaps the transmission path fluctuation period, and the

normal transmission mode is selected when the packet transmission period does not overlap the transmission path fluctuation period **(Frames are processed through an estimation algorithm involving a conversion of signal information to digital data bits, a calculation is performed to correct the phase variation due to fading, and the timing of the transmission is changed to compensate for the fading, if needed, and not compensate for the fading if not needed, Abstract, lines 6-15, Paragraph 60, lines 1-4, Paragraph 83, lines 5-7, Paragraph 86, lines 8-11 and Paragraph 93, lines 3-14),** except for a discharge lamp is not named as that which causes the transmission path fluctuation. Examiner takes Official Notice that it would have been an obvious matter of design choice to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to name a discharge lamp as a specific cause of transmission fluctuation instead of the Doppler Effect as the cause of fading for the benefit of using the light emission to identify the transmission path fluctuation period.

Regarding claim 17, Seki teaches the wireless communication method as described in claim 15. Seki further teaches a photoelectric conversion unit **(A complex impulse response measurement unit, 11 of Fig. 13, that generates a complex impulse response transmitted to the phase difference calculator)** which generates an electric signal from ambient light around the wireless communication apparatus, wherein the transmission path fluctuation period is detected based on change in output from the photoelectric conversion unit **(A phase difference calculator, 12 of Fig. 13,**

determines the path with the least fading from the complex impulse response signal, Paragraph 86, lines 8-11, Paragraph 87, lines 9-13 and Paragraph 91, lines 5-8), except for the conversion unit used to generate the signal is the complex impulse response extractor instead of a photoelectric conversion unit. Examiner takes Official Notice that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use a photoelectric conversion unit as a matter of design choice for the benefit of outputting the signal to be used to identify fluctuations in transmission.

Regarding claim 18, Seki teaches the wireless communication method as described in claim 15, further comprising a means of detecting a rising period and falling period of light output by the discharge lamp, wherein at least the rising period and falling period are detected as the transmission path fluctuation period **(Paragraph 54, lines 3-8 and Fig. 6).**

Regarding claim 22, Seki teaches the wireless communication method as described in claim 15, wherein the restricted transmission mode is a mode in which data packets are transmitted at a low rate **(Transmission packets are transmitted at a lower rate due to fading, Paragraph 47, lines 4-7)**.

4. Claims 2 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki, in view of Redi, et al **(US PG Publication 2002/0071395)**. From now on, Redi, et al, will be referred to as Redi.

Regarding claim 2, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the transmission path fluctuation period detection unit comprises an AC power supply measuring unit for detecting the voltage or current level of the AC power source, and the transmission path fluctuation period is detected based on change in the voltage or current. Redi teaches the transmission path fluctuation period detection unit comprises an AC power supply measuring unit for detecting the voltage or current level of the AC power source, and the transmission path fluctuation period is detected based on change in the voltage or current **(A wireless communications system includes a detection unit called an electronic processor circuit that evaluates power data, and a power supply, 5 of Fig. 2, wherein a parameter value called RSSI voltage and "side information" from neighboring nodes can be used to detect path loss, Paragraph 17, lines 9-14, Paragraph 40, lines 2-6 and 15-17, Paragraph 42, Paragraph 46, lines 1-2, Paragraph 69, lines 1-7 and Paragraph 70, lines 13-15).** It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use a power supply measuring unit to detect a change in voltage as taught by Redi for the benefit of having a reference parameter to be used to detect periods during which fluctuation occurs.

Regarding claim 16, Seki teaches a wireless communication method as described in claim 15. Seki does not teach an AC power supply measuring unit for detecting the voltage or current level of the AC power source, wherein the transmission path fluctuation period is detected based on change in the voltage or current. Redi teaches the AC power supply measuring unit for detecting the voltage or current level of the AC power source, wherein the transmission path fluctuation period is detected based on change in the voltage or current **(A wireless communications system includes a detection unit called an electronic processor circuit that evaluates power data, a power supply, 5 of Fig. 2, wherein a parameter value called RSSI voltage and "side information" from neighboring nodes can be used to detect path loss, Paragraph 17, lines 9-14, Paragraph 40, lines 2-6 and 15-17, Paragraph 42, Paragraph 46, lines 1-2, Paragraph 69, lines 1-7 and Paragraph 70, lines 13-15).** It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use a power supply measuring unit to detect a change in voltage as taught by Redi for the benefit of having a reference parameter to be used to detect periods during which fluctuation occurs.

6. Claims 6-7, 9-10, 20-21 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki, in view of Scherzer, et al **(US 2004/0037258)**. From now on, Scherzer, et al, will be referred to as Scherzer.

Regarding claim 6, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the transmission path fluctuation period detection unit comprises a normal transmission confirmation unit that receives a reception confirmation signal output by a destination terminal in response to a wireless signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, and the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit. Scherzer teaches the transmission path fluctuation period detection unit comprises a normal transmission confirmation unit that receives a reception confirmation signal output by a destination terminal in response to a wireless signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, and the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit **(A wireless communication system can schedule a transmission to a destination terminal as a test to see if it receives an ACK/Acknowledgment signal in order to determine any periods of fluctuation, indicated by transmission characteristics such as channel gain that it uses to update a channel gain matrix, Paragraph 46, 5-15 and Paragraph 46, lines 1-4 and 20-24)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have a transmission path fluctuation period detection unit comprise a normal transmission confirmation unit that receives a reception confirmation signal output by a destination terminal in response to a wireless

signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, and the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit for the benefit of updating data in a matrix or some other table to ensure channel quality and resistance to transmission fluctuations across all Access Points.

Regarding claim 7, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which signals are not transmitted. Scherzer teaches the restricted transmission mode is a mode in which signals are not transmitted **(Paragraph 20, lines 12-16)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to include a method of not transmitting signals during a restricted transmission mode for the benefit of saving possible errors due to attempting transmissions during periods where transmission is not possible but do not change.

Regarding claim 9, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted to a specific predetermined terminal. Scherzer teaches the restricted transmission mode is a mode in which data packets are transmitted to a specific predetermined terminal **(A packet transmission is scheduled**

to a specific terminal based on interferences that may occur, Paragraph 45, lines 10-11 and Paragraph 77, lines 1-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have the restricted transmission mode be a mode in which data packets are transmitted to a specific predetermined interval to increase the probability of success in the transmission of the packet.

Regarding claim 10, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate. Scherzer teaches the restricted transmission mode is a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate **(A packet transmission is scheduled to a specific terminal based on interferences that may occur, Paragraph 45, lines 10-11 and Paragraph 77, lines 1-5)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have the restricted transmission mode be a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate to increase the probability of success in the transmission of the packet.

Regarding claim 20, Seki teaches a wireless communication method as described in claim 15. Seki does not teach a normal transmission confirmation unit that

receives a reception confirmation signal output by a destination terminal in response to a wireless signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, wherein the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit. Scherzer teaches a normal transmission confirmation unit that receives a reception confirmation signal output by a destination terminal in response to a wireless signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, wherein the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit **(A wireless communication system can schedule a transmission to a destination terminal as a test to see if it receives an ACK/Acknowledgment signal in order to determine any periods of fluctuation, indicated by transmission characteristics such as channel gain that it uses to update a channel gain matrix, Paragraph 46, 5-15 and Paragraph 46, lines 1-4 and 20-24)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have a transmission path fluctuation period detection unit comprise a normal transmission confirmation unit that receives a reception confirmation signal output by a destination terminal in response to a wireless signal transmitted from the wireless communication apparatus and detects if the transmitted wireless signal was correctly received by the destination terminal, and the transmission path fluctuation period is detected based on the output signal from the normal transmission confirmation unit for the benefit of

updating data in a matrix or some other table to ensure channel quality and resistance to transmission fluctuations across all Access Points.

Regarding claim 21, Seki teaches a wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which signals are not transmitted. Scherzer teaches the restricted transmission mode is a mode in which signals are not transmitted **(Paragraph 20, lines 12-16)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to include a method of not transmitting signals during a restricted transmission mode for the benefit of saving possible errors due to attempting transmissions during periods where transmission is not possible but do not change.

Regarding claim 23, Seki teaches a wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted to a specific predetermined terminal. Scherzer teaches the restricted transmission mode is a mode in which data packets are transmitted to a specific predetermined terminal **(A packet transmission is scheduled to a specific terminal based on interferences that may occur, Paragraph 45, lines 10-11 and Paragraph 77, lines 1-5)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have the restricted transmission mode be a mode in which data packets are transmitted to a

specific predetermined interval to increase the probability of success in the transmission of the packet.

Regarding claim 24, Seki teaches a wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate. Scherzer teaches the restricted transmission mode is a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate **(A packet transmission is scheduled to a specific terminal based on interferences that may occur, Paragraph 45, lines 10-11 and Paragraph 77, lines 1-5)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to have the restricted transmission mode be a mode in which data packets are transmitted to a specific terminal determined from an accumulated error rate to increase the probability of success in the transmission of the packet.

6. Claims 5, 11-14, 19, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki, in view of Jorswieck, et al **(US 2006/0193294)**. From now on, Jorswieck, et al, will be referred to as Jorswieck.

Regarding claim 5, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the transmission path fluctuation period

detection unit comprises a means of detecting an error rate distribution for the received data, and the transmission path fluctuation period is detected based on the error rate distribution. Jorswieck teaches the transmission path fluctuation period detection unit comprises a means of detecting an error rate distribution for the received data, and the transmission path fluctuation period is detected based on the error rate distribution **(A target bit error rate is related to power and used in calculating a period during which interference occurs, Paragraph 71 and Fig. 5)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use an error rate distribution for the benefit of adjusting the power and bit rate to meet the target bit error rate for optimal transmission.

Regarding claim 11, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted using few spatial multiplex levels or without multiplexing. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted using few spatial multiplex levels or without multiplexing **(Transmit power is minimized and used efficiently while using the fewest number of antennas possible, minimizing the spatial multiplex levels in a MULTIPLE-INPUT MULTIPLE-OUTPUT (MIMO) wireless communication system where packets of data are encoded and transmitted, Paragraph 18, Paragraph 54, lines 1-3, Paragraph 44, lines 13-18 and Paragraph 67, lines 18-22)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the

invention of Seki to minimize spatial multiplexing and in turn the number of antennas and the amount of power necessary to transmit packet frames.

Regarding claim 12, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted using fewer antennas than the maximum number of possible antennas. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted using fewer antennas than the maximum number of possible antennas **(Transmit power is minimized and used efficiently while using the fewest number of antennas possible in a MIMO wireless communication system where packets of data are transmitted, Paragraph 18, Paragraph 54, lines 1-3, and Paragraph 67, lines 18-22)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to minimize the number of antennas and the amount of power necessary to transmit packet frames.

Regarding claim 13, Seki teaches a wireless communication apparatus as described in claim 1. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted with directivity control by means of transmission diversity. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted with directivity control by means of transmission diversity **(Space-time coding is employed, which is a method used in spatial multiplex wireless MIMO communications system to optimize transmission through**

diversity coding, Paragraph 52, Paragraph 53 and Paragraph 54, lines 1-3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to transmit data packets with directivity control by means of transmission diversity for the benefit of using a coding method that is either optimal or at least common to the active subchannels, when the channel is unknown.

Regarding claim 14, Seki, in view of Jorswieck, teaches a wireless communication apparatus as described in claim 11. Jorswieck further teaches data denoting the spatial multiplex level is inserted in and transmitted with the wireless packets **(Transmission of data packets is adjusted to meet the spatial multiplexing necessary to optimize transmission based on coded data helping to identify the level of spatial multiplexing to be employed in the process, Paragraph 14, lines 1-19)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to insert data denoting the spatial multiplex level and transmit this data with the wireless packets for the benefit of ensuring channel quality in the optimization process.

Regarding claim 19, Seki teaches a wireless communication method as described in claim 15. Seki does not teach a means of detecting an error rate distribution for the received data, wherein the transmission path fluctuation period is detected based on the error rate distribution. Jorswieck teaches a means of detecting an error rate distribution for the received data, wherein the transmission path

fluctuation period is detected based on the error rate distribution **(A target bit error rate is related to power and used in calculating a period during which interference occurs, Paragraph 71 and Fig. 5)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to use an error rate distribution for the benefit of adjusting the power and bit rate to meet the target bit error rate for optimal transmission.

Regarding claim 25, Seki teaches the wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted using few spatial multiplex levels or without multiplexing. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted using few spatial multiplex levels or without multiplexing **(Transmit power is maximized and maintained steady while using the fewest number of antennas possible, minimizing the spatial multiplex levels in a MIMO wireless communication system where packets of data are encoded and transmitted, Paragraph 18, Paragraph 54, lines 1-3, Paragraph 44, lines 13-18 and Paragraph 67, lines 18-22).** It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to minimize spatial multiplexing and in turn the number of antennas and the amount of power necessary to transmit packet frames.

Regarding claim 26, Seki teaches a wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted using fewer antennas than the maximum number of possible antennas. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted using fewer antennas than the maximum number of possible antennas **(Transmit power is maximized and maintained steady while using the fewest number of antennas possible in a MIMO wireless communication system where packets of data are transmitted, Paragraph 18, Paragraph 54, lines 1-3, and Paragraph 67, lines 18-22)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to minimize the number of antennas and the amount of power necessary to transmit packet frames.

Regarding claim 27, Seki teaches a wireless communication method as described in claim 15. Seki does not teach the restricted transmission mode is a mode in which data packets are transmitted with directivity control by means of transmission diversity. Jorswieck teaches the restricted transmission mode is a mode in which data packets are transmitted with directivity control by means of transmission diversity **(Space-time coding is employed, which is a method used in spatial multiplex wireless MIMO communications system to optimize transmission through diversity coding, Paragraph 52, Paragraph 53 and Paragraph 54, lines 1-3)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to

modify the invention of Seki to transmit data packets with directivity control by means of transmission diversity for the benefit of using a coding method that is either optimal or at least common to the active subchannels, when the channel is unknown.

Regarding claim 28, Seki, in view of Jorswieck, teaches a wireless communication method as described in claim 25. Jorswieck further teaches data denoting the spatial multiplex level is inserted in and transmitted with the wireless packets **(Transmission of data packets is adjusted to meet the spatial multiplexing necessary to optimize transmission based on coded data helping to identify the level of spatial multiplexing to be employed in the process, Paragraph 14, lines 1-19)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Seki to insert data denoting the spatial multiplex level and transmit this data with the wireless packets for the benefit of ensuring channel quality in the optimization process.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PG Publication 2005/075073 refers to a successive interference cancellation receiver processing with selection diversity.

US PG Publication 2004/0121827 refers to a receiving apparatus, transmitting apparatus, and reception method.

US PG Publication 2004/00959 refers to a method and apparatus for optimization of wireless multipoint electromagnetic communication networks

US PG Publication 2003/0035491 refers to a method and apparatus for processing data in a multiple-input multiple-output (MIMO) communication system utilizing channel state information.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANK DONADO whose telephone number is (571) 270-5361. The examiner can normally be reached on Monday-Thursday, 7:30 am -5 pm, alternate Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benny Tieu can be reached on 571-272-7490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Frank Donado
Art Unit 4173

/Benny Q Tieu/
Supervisory Patent Examiner, Art Unit 4173